

What is Claimed is:

D/
C/

1. A connector for connecting together the free pin end and the free box end of two tubular bodies comprising:

5 a pin having pin threads formed externally on an end of a first tubular body, said pin threads extending from a starting point on said first tubular body and terminating adjacent the free pin end, said pin threads further being formed on a tubular section of said first tubular body having an outside diameter no greater than an outside diameter of a major length of said first tubular body,

10 a box having box threads formed internally on an end of a second tubular body, said box threads extending from a starting point on said second tubular body and terminating adjacent the free box end,

15 said pin adapted to be received in and threadedly engaged with said box, an external seal between said pin and said box adjacent said pin thread starting point and adjacent said free box end, said external seal comprising a frustoconical pin seal surface formed externally of said pin, said pin seal surface having a decreasing diameter in a direction toward the free pin end and a frustoconical box seal surface formed internally of said box, said box seal surface having an increasing internal diameter in a direction toward the free box end, and

20 an internal seal adjacent said box thread starting point and said free pin end whereby said pin threads and said box threads are confined between said external and internal seals when said pin and box are engaged.

2. A connector as defined in Claim 1 wherein said pin threads run out to an outside diameter of said first tubular at said starting point of said pin threads.

3. A connector as defined in Claim 1 wherein said pin threads are substantially cylindrical between said starting point of said pin threads and said free pin end.

5 4. A connector as defined in Claim 1 wherein said pin seal surface is formed on a radially enlarged section of said first tubular body.

10 5. A connector as defined in Claim 1 wherein said pin threads and said box threads are fully confined between said external and internal seals when said pin and box are engaged.

6. A connector for connecting together the free pin end and the free box end of two tubular bodies comprising:

a pin having pin threads formed externally on an end of a first tubular body, said pin threads extending from a starting point on said first tubular body and terminating adjacent the free pin end, said pin threads further being formed on a tubular section of said first tubular body having an outside diameter no greater than an outside diameter of a major length of said first tubular, said pin threads running out on said outside diameter at said starting point,

20 a box having box threads formed internally on an end of a second tubular body, said box threads extending from a starting point on said second tubular body and terminating adjacent the free box end, said pin adapted to be received in and threadedly engaged with said box,

25 an external seal between said pin and said box adjacent said pin thread starting point and adjacent said free box end, said external seal comprising an annular,

10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95

elastomeric seal disposed against said pin and said box, and

an internal seal adjacent said box thread starting point and said free pin end whereby said pin threads and said box threads are at least partially confined between said external and internal seals when said pin and box are engaged.

5

7. A connector as defined in Claim 6 wherein said pin threads and said box threads are fully confined between said external and internal seals when said pin and box are engaged.

10
11
12
13
14
15

8. A connector as defined in Claim 6 wherein said external seal is an annular, a elastomeric seal ring carried in an annular groove formed in said first tubular body.

9. A connector as defined in Claim 6 wherein said external seal is an annular, elastomeric seal ring carried in an annular groove formed in said second tubular body.

10. A connector as defined in Claim 5 wherein said external seal is an annular, elastomeric seal ring carried externally of said first tubular and adapted to engage a face formed at an axial end of said box.

20

11. A connector as defined in Claim 10 wherein said seal ring is retained axially and positioned between said face and a back up ring secured to said pin.

25

12. A connector as defined in Claim 6 wherein said box carries a frustoconical seal surface adjacent a face at an axial end of said second tubular body and said pin carries an annular, elastomeric seal ring adjacent said starting point for said pin threads whereby

26

said frustoconical seal surface engages said seal ring to provide said external seal when said pin and box are engaged.

13. A connector for connecting together the free pin and the free box end of two tubular bodies comprising:

a pin having pin threads formed externally on an end of a first tubular body, said pin threads extending from a starting point on said first tubular body and terminating in the area of the free pin end.

a box having box threads formed internally on an end of a second tubular body, said box threads extending from a starting point on said second tubular body and terminating in the area of the free box end.

a pin adapted to be received in and threadedly engaged with said box,

an external seal between said pin and said box adjacent said pin thread starting point and adjacent said free box end, said external seal comprising an annular, elastomeric seal disposed against said pin and said box,

an internal seal adjacent said box thread starting point and said free pin end whereby said pin threads and said box threads are at least partially confined between said external and internal seals when said pin and box are engaged.

compression ring threads formed in the area of said free end of said box,

a threaded, annular compression ring encircling said first tubular body and adapted to threadedly engage said compression ring threads, and

an annular, elastomeric seal ring disposed between said compression ring and said box whereby threaded engagement of said compression ring with said box forms said external seal.

14. A connector as defined in Claim 13 wherein compression ring threads are formed on an external surface of said box.

5 15. A connector as defined in Claim 13 wherein compression ring threads are formed on an internal surface of said box.

10 16. A connector as defined in Claim 13 wherein said compression ring engages said box to form a metal-to-metal seal whereby said compression ring threads are disposed between said elastomeric seal ring and said metal-to-metal seal.

15 17. A connector as defined in Claim 13 further including an annular, elastomeric crush ring axially displaced from said seal ring and adapted to be compressed between said compression ring and said box whereby said compression ring threads are disposed between said seal ring and said crush ring when said compression ring is engaged with said box.

Adm
C2